

# A new genus, *Smilirhexia*, of Smiliini (Hemiptera, Membracidae) from Costa Rica

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## Abstract

*Smilirhexia naranja*, **gen. n.** and **sp. n.**, is described from Central America, the southern limit of the tribe Smiliini, and represents a strong divergence from the morphology of the oak-feeding genera prevalent in North America.

## Keywords

Membracoidea, Homoptera, Auchenorrhyncha, new genus, new species

## Introduction

The tribe Smiliini is the nominotypical tribe of Smiliinae, one of the largest subfamilies of treehoppers (McKamey 1998). The subfamily is native to the New World, being most speciose in the tropics. In contrast to this subfamilial pattern, the species of Smiliini are primarily North American, with the great majority of species oligophagous on oaks (*Quercus* spp., Fagaceae) and the southernmost species recorded from Panama (R. Cocroft, pers. comm.). Excluding the odd smiliine genus *Antianthe* Fowler, the tribe's southern limit is even more restricted than that of oaks, which extend southward to Colombia.

The mostly recently described species is *Telamona archiboldi* Froeschner (1968), from Florida. There have been only three recent taxonomic works on Smiliini (McKamey and Deitz 1991, Wood and Pesek 1992, Wallace and Deitz 2003). The other



recent papers consist of local or regional checklists (Kopp and Yonke 1973, 1974; Johnson and Freytag 1997; Wallace et al. 2003; Flynn et al. 2003; Wallace and Troyano 2006). Quisenberry et al. (1978) described the immatures of most genera of Smiliini.

Morphological terminology follows Deitz (1975).

***Smilirhexia* McKamey, gen. n.**

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Type species: *Smilirhexia naranja*, sp. n.

**Diagnosis.** The new genus differs from all other genera of the tribe in having a smooth and shining pronotum, which is broad, almost completely convex, and brightly colored.

**Description of male.** Head (Fig. 3) glabrous, subtriangular in anterior view, ocelli equidistant from each other and from eyes. Pronotum (Figs 1-3) entirely concealing scutellum, convex, dorsal carina elevated only in posterior half, and weakly, otherwise delineated by absence of punctures; surface shining, punctures shallow and lacking setae; humeral angles not projected laterally beyond wing bases; posterior pronotal process ending at apex of forewing cell  $M_{3+4}$  (last apical cell). Forewing (Fig. 1) free, in repose not concealed wholly or in part by pronotum; without r-m crossveins, with veins R and M adjacent basally, weakly divergent soon after,  $R_{4+5}$  and  $M_{1+2}$  confluent for a short distance before apex, and strongly divergent at wing apex;  $R_{2+3}$  present as distinct branch of R;  $R_4$  and  $R_5$  separately joined to vein M, creating a small cell  $R_4$  near center of wing. Hind wing with short r-m crossvein (holotype right wing) or veins R and M fused at single point (holotype left wing). Femora, tibiae, and tarsomeres lacking cucullate setae except metathoracic femur with two apically, metathoracic tibia with three rows (row 2 double), and metathoracic tarsomere I with 4 cucullate setae at apex. Metathoracic coxa and trochanter without apposed processes. Abdomen lacking fenestrae or mid-dorsal protuberances.

**Female.** Unknown.

**Distribution.** Costa Rica, Puntarenas Prov.

**Material Examined.** Holotype male of *Smilirhexia naranja*, sp. n.

**Etymology.** The new genus name is feminine and combines the name of its apparent tribe and the name of an unrelated genus, *Rhexia* Stål, which it resembles superficially [e.g., *Rhexia viridicollis* (Fowler), illustrated by Deitz (1983)].

**Discussion.** The distally confluent radial and medial veins, which diverge before the forewing apex, and the lack of processes on the metathoracic coxa and trochanter place the new genus firmly in the subfamily Smiliinae. In Deitz's key to the higher classification, the genus keys to the tribe Smiliini due to the presence of 2 m-cu crossveins. The only discrepancy is that in the new genus, the forewing is completely exposed rather than partially concealed. Most genera of the tribe are morphologically similar and authentic records of only a few species exist for Central America, the tribe's southern limit. The notable exception is the genus *Antianthe* Fowler, which is laterally compressed, strongly crested, and with pronounced humeral angles, and which occurs from the southern



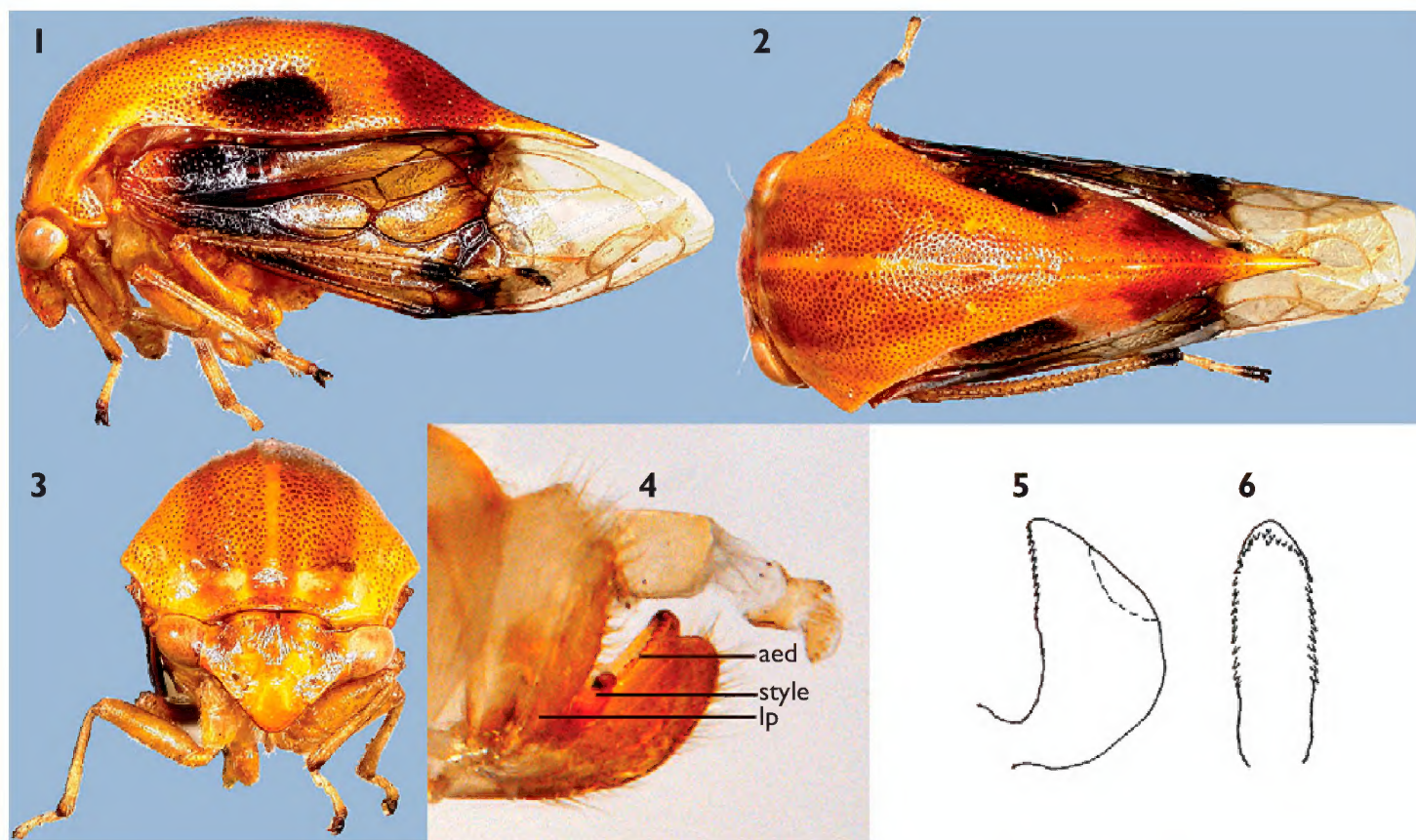
USA to South America. *Smilirhexia* appears to represent another distinct morphological form for *Smiliini* that may help to elucidate the evolutionary origin of this tribe.

Species of the subfamily Darninae, which appears to be a close relative of *Smiliinae*, also have the forewing with two r-m crossveins, as in *Smiliini*. Interestingly, *Cymbomorpha* Stål (Cymbomorphini, Darninae) occasionally have the characteristic forewing venation of *Smiliinae*, with veins R and M confluent for a short distance before the apex, and double setation in metathoracic tibial row II. Both *Cymbomorpha* and *Eumela* Stål, the other cymbomorphine genus, and *Smilidarnis* Andrade, 1989 (a Neotropical, unplaced genus with characters of both Darninae – especially Cymbomorphini – and *Smiliinae*), exhibit the shining pronotal surface and completely exposed forewings of the new genus *Smilirhexia*.

***Smilirhexia naranja* McKamey, sp. n.**

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**Description of male.** Length including forewings in repose 8.0 mm, width between humeral angles 4.6 mm. Color. Head yellow-orange. Pronotum yellow-orange dorsally and posteriorly, yellow laterally except with large lateral indentation at mid-length black. Forewing fuscous at coriaceous base and transversally at distal crossveins, cells tinted yellow basally, hyaline distally. Male terminalia (Figs 4-6): lateral plate distinct,



**Figs 1-6.** *Smilirhexia naranja*, sp. n. 1-3, Lateral, dorsal, and anterior views of head, pronotum, wings, and legs (forewing anterior apices presumably rolled inward as a preservative side-effect). 4, Lateral view, cleared terminalia before dissection. 5-6. Aedeagus in lateral and anterior views, respectively. *aed*, aedeagus; *lp*, unarmed lateral plate.



long, lacking protuberances. Aedeagus narrow in anterior view, in lateral view U-shaped and widest at mid-length, anterior margin with many denticulae of increasing size ventrally; styles simple, distally recurved (Fig. 4), apex acute.

**Female.** Unknown.

**Distribution.** COSTA RICA: Puntarenas Prov.: Coto Brus, nr. San Vito, Estación Biológica Las Alturas, 8° 57'N, 82°50'W.

**Material Examined.** Holotype male, pinned, dissected, with labels “Est. Biol. Las Alturas, / 1500m., Coto Brus, Prov. / Puntarenas. Costa Rica, / F. Araya, 23 mar a 2 may / 1992, L-S 322500,591300”, “COSTA RICA INBIO / CR1000 / 777014”, and “HOLOTYPE / *Smilirhexia* / *naranja* McKamey”. Deposited at the Instituto Nacional de Biodiversidad (INBio), Santo Domingo de Heredia, Costa Rica.

**Etymology.** The species epithet is a Spanish adjective for orange, the predominant pronotal color of the species.

**Notes.** In Costa Rica, most oaks occur in submontane and montane forests (1500-3200m) (Kappelle et al. 1992). In the Cordillera de Talamanca, which contains the type locality, there are at least eight oak species, with at least three reported from Coto Brus itself: *Quercus seemannii* Liebm., *Q. oocarpa* Liebm., and *Q. rapurahuensis* Pittier ex Trel. (Giddy 2008), and another (*Q. insignis* M. Martens & Gal.) at 1300m on the trail to Las Alturas (Instituto Nacional de Biodiversidad 2008). In short, it is easily possible that this new treehopper genus, like others in the tribe, feeds on *Quercus*.

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